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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,566	06/28/2001	Masato Imai	09793822-0149	5465

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EXAMINER

NGUYEN, HOAN C

ART UNIT PAPER NUMBER

2871

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/894,566

Applicant(s)

IMAI ET AL.

Examiner

HOAN C. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 6, 2004 has been entered.

Applicants cancelled claims 2-3 and 13. Therefore, claims 1, 4-12 are still pending. Applicant's arguments with respect to Amended claim 1 based on the amendment filed on July 6, 2004 have been considered but are moot in view of the same ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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1. Claims 1 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over a conventional art (Figs. 1A-C) admitted by applicants in view of Tokuo (JP2000075295).

In regard to claim 1, applicants admit (Figs. 1A-C) a liquid crystal display device comprising:

- a first substrate (upper substrate 8);
- a second substrate (lower substrate 4) arranged facing each other with a pre-set gap in-between;
- liquid crystals 16 held in said gap;
- means for driving a cell with applying an electrical field to said liquid crystals to change the state of orientation thereof;
- a wall structure 17 formed in each of a plurality of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying in each small-sized area axially symmetrically on application of said electrical field; wherein wall structure encircling a rectangular area is formed on the first substrate 8; said rectangular area forming a concave structure 15 (paragraphs 9-12).

wherein

Claim 12:

- said means (electrodes 10 and 10Z) for applying the electric field comprising an electrode formed on each of the substrates, wherein the electrodes are facing electrodes with said liquid crystals therebetween

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However, in a conventional art, applicants fail to disclose

- a groove structure formed within the concave structure in each of said small-sized areas in first substrate 8 and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure, wherein said groove structure extends along diagonal lines of said rectangular area.
- features in claim 11.

Tokuo teaches (Figs. 17-18) a groove structure formed in each of said small-sized areas in first substrate 110 and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure, wherein said groove structure 115L/R extends along diagonal lines of said rectangular area for realizing display of a broad visual field angle with reducing visual angle dependency having been high toward left and right directions by providing a part of right up and/or right down with respect to either side of a display pixel in a linear part of an alignment controlling inclination part.

In regard to claim 11, it is well-known in the art that the Plasma Address LCD device comprising the means for applying the electrical field is made up of signal electrodes formed in columns on one substrate and discharge channels formed in rows in the other substrate, said discharge channel being separated from said liquid crystals by a dielectric sheet for generating a plasma addressed liquid crystal display device.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as applicant admitted with a groove structure formed in each of said small-sized areas in first substrate and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure, wherein said groove structure extends along diagonal lines of said rectangular area for realizing display of a broad visual field angle with reducing visual angle dependency having been high toward left and right directions by providing a part of right up and/or right down with respect to either side of a display pixel in a linear part of an alignment controlling inclination part as taught by Tokuo (col. 5 lines 60-67).

2. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over a conventional art (Figs.1A-C) admitted by applicants in view of Tokuo (JP2000075295) as applied to claims 1 and 11-12 above and in further view of Kojima et al. (US5650867).

A conventional art and Tokuo fail to disclose features of claims 4-5.

Kojima et al. teach (Fig. 3) a liquid crystal display device, wherein said one substrate 14 is a transparent plate and a color filter layer 31, transparent insulative film 13 on color filter for protecting color filter, and a transparent electrically conductive layer (electrode 11) formed on one surface thereof.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display

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device as Tokuo disclosed with color filter formed on substrate for realizing color display, transparent insulating film on color filter for protecting color filter, and a transparent electrically conductive layer formed on one surface thereof as taught by. Kojima et al.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US6437845B1) in view of Tokuo (JP2000075295) as applied to claims 1 and 11-12 above and in further view of Kume et al. (US6330049B1).

A conventional art and Tokuo fail to disclose features of claim 6.

Kume et al teach (in abstract) liquid crystals are of negative dielectric constant anisotropy and the surfaces of said two substrates are processed for orientation for orienting said liquid crystals perpendicularly in the absence of applied voltage for forming the partition wall has a section which is inclined with respect to the surface of the first substrate when applied voltage in order to widen viewing angle (in abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Tokuo disclosed with liquid crystals are of negative dielectric constant anisotropy and the surfaces of said two substrates are processed for orientation for orienting said liquid crystals perpendicularly in the absence of applied voltage for forming the partition wall has a section which is inclined with respect to the surface of the first substrate when applied voltage in order to widen viewing angle as taught by Kume et al. (in abstract).

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4. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over a conventional art (Figs.1A-C) admitted by applicants in view of Tokuo (JP2000075295) as applied to claims 1 and 11-12 above and in further view of Yamada et al. (US6437845B1).

A conventional art and Tokuo fail to disclose features of claims 7-9.

In regard to claim 7, Yamada et al. teach the photopolymerizable resin (i.e., the monomer) added to the liquid crystal (col. 1 lines 50-53), which results in a liquid crystal display device having excellent display qualities due to the reduction of poorly oriented liquid crystal, thereby stabilizing the state of axially symmetrical orientation produced on application of an electrical field.

In regard to claim 8, Yamada et al. teach (Fig. 2A-C) the axially symmetrical orientation of said liquid crystals is distorted along a central axis and display is performed by exploiting TN mode liquid crystals, which utilizes optical rotating characteristics for realizing large screen display (col.1 lines 7-11).

In regard to claim 9, Yamada et al. teach a chiral substance is added to the liquid crystals for distorting the state of orientation thereof (col. 14 lines 32-64).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as applicant admitted with (a) the limitation of claim 7 for excellent display qualities due to the reduction of poorly oriented liquid crystal as taught by

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Yamada et al.; (b) the limitation of claim 8 for realizing large screen display; and limitation of claim 9 for improving the stability of the axially symmetrical alignment as taught by Yamada et al. (col. 14 lines 32-64).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US6437845B1) in view of Tokuo (JP2000075295) as applied to claims 1 and 11-12 above and in further view of YAMAMOTO (EP 0 886170A2).

A conventional art and Tokuo fail to disclose features of claim 10.

YAMAMOTO teach (in abstract) a liquid crystal display device wherein the axially symmetrical orientation of said liquid crystals is not distorted along a central axis and display is performed by exploiting ECB mode liquid crystals, which utilizes birefringence for high reliability without light leakage and unnecessary coloring even under a high temperature environment (in abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Tokuo disclosed wherein the axially symmetrical orientation of said liquid crystals is not distorted along a central axis and display is performed by exploiting ECB mode liquid crystals, which utilizes birefringence for high reliability without light leakage and unnecessary coloring even under a high temperature environment as taught by YAMAMOTO (in abstract).

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Response to Arguments

Applicant's arguments filed on July 6 2004 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are follows:

A. There is none of the conventional art, Yamada, Koiima, Kume, or Yamamoto references teaches "a liquid crystal display where the liquid crystals in each of a plurality of small-sized areas are divided into four groups and are oriented symmetrically with respect to an axis perpendicular to a point of intersection of two diagonals lines of a rectangular area encircled by a wall structure", as required by claim 1. Nor is this feature obvious in light of any of the cited art either alone or in combination.

B. Yamada actually discloses (Fig. 2C) the liquid crystal molecules 5a aligned "concentrically" rather than symmetrically.

As explained in the Applicants' specification, stating that "the liquid crystal molecules in each of four groups are oriented symmetrically with respect to an axis perpendicular to a point of intersection of two diagonals lines" means that "the liquid crystal molecules 16M are oriented in the vertical directions (respect to what? Vertical alignment?) in the domains (1) and (3), while being oriented in the horizontal directions (respect to what? horizontal alignment?) in the domains (2) and (4)".

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Examiner's responses to Applicants' ONLY arguments are follows:

A. The applicants admits a conventional art (1A-C) disclosing "a liquid crystal display where the liquid crystals in each of a plurality of small-sized areas are divided into four groups (as Fig. 1C shown) and are oriented symmetrically with respect to an axis perpendicular to a point of intersection of two diagonals lines of a rectangular area 15 encircled by a wall structure 17 (as Fig. 1C shown)".

B. Yamaha Yamada actually discloses (Fig. 2C) the liquid crystal molecules 5a aligned "concentrically" (point symmetry) which is symmetrically "respect to an axis perpendicular to a point of intersection of said two diagonal lines" as claim 1 cited.

As explained in the Applicants' specification, "the liquid crystal molecules 16M are oriented in the vertical direction (respect to what? Vertical alignment?) in the domains (1) and (3), while being oriented in the horizontal directions (respect to what? horizontal alignment?) in the domains (2) and (4)", **which are not cited in the claim 1.**

However, the Applicants' specification discloses (Fig. 2C) the liquid crystal molecules 16M in four domains (1)-(4) actually oriented ***inwardly*** and ***symmetrically*** "respect to an axis perpendicular to a point of intersection of said two diagonal lines".

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Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim H Robert can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HOAN C. NGUYEN
Examiner
Art Unit 2871

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TARIFUR R. CHOWDHURY
PRIMARY EXAMINER